WE CLAIM:

- 1. A process for producing an integrated circuit comprising reducing copper oxide on a substrate by exposure to one or more organic reducing agents prior to deposition of a layer comprising silicon carbide.
 - 2. The process of Claim 1, wherein the layer further comprises oxygen.
 - 3. The process of Claim 1, wherein the layer serves as a hard mask.
- 4. The process of Claim 1, wherein the organic reducing agent comprises at least one functional group selected from the group consisting of alcohol (-OH), aldehyde (-CHO), and carboxylic acid (-COOH).
- 5. The process of Claim 4, wherein the organic reducing agent is selected from the group consisting of primary alcohols, secondary alcohols, tertiary alcohols, polyhyrdroxyalcohols, cyclic alcohols, and halogenated alcohols.
- 6. The process of Claim 4, wherein said organic reducing agent is selected from the group consisting of:

compounds having the general formula R^3 -CHO, wherein R^3 is hydrogen or a linear or branced C_1 - C_{20} alkyl or alkenyl group;

compounds having the general formula OHC-R⁴-CHO, wherein R^4 is a linear or branched C_1 - C_{20} saturated or unsaturated hydrocarbon;

a compound of the formula OHC-CHO;

halogenated aldehydes; and other derivatives of aldehydes.

7. The process of Claim 4, wherein the organic reducing agent is selected from the group consisting of:

compounds of the general formula R^5COOH , wherein R^5 is hydrogen or a linear or branched C_1 - C_{20} alkyl or alkenyl group;

polycarboxylic acids;

halogenated carboxylic acids; and

other derivatives of carboxylic acids.

8. The process of Claim 1, wherein said copper oxide is presentafter a chemical mechanical polishing (CMP) step.

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- 9. The process of Claim 1, wherein said copper oxide is formed by exposure to a clean room atmosphere.
- 10. The process of Claim 1, wherein said exposure takes place in a first reaction chamber.
 - 11. The process of Claim 10, wherein said layer serves as an etch stop.
- 12. The process of Claim 11, wherein deposition of the etch stop layer also takes place in the first reaction chamber.
- 13. The process of Claim 11, wherein deposition of the etch stop layer takes place in a second reaction chamber clustered with the first reaction chamber.
- 14. The process of Claim 11, wherein the temperature in the reaction chamber is less than about 450°C.
- 15. The process of Claim 11, wherein the temperature in the reaction chamber is between about 200 and 430°C.
- 16. The process of Claim 11, wherein the temperature in the reaction chamber is about 400°C.
- 17. The process of Claim 11, wherein reduction of copper oxide and deposition of the etch stop are carried out in the same reaction chamber at about the same temperature.
- 18. A process for producing an integrated circuit comprising reducing copper oxide on a substrate by exposure to hydrogen plasma prior to deposition of an etch stop layer.
- 19. The process of Claim 18, wherein the etch stop layer comprises silicon carbide.
- 20. The process of Claim 19, wherein the etch stop layer further comprises oxygen.
 - 21. The process of Claim 18, wherein the reduction of copper oxide and deposition of the etch stop layer are carried out in the same reaction chamber.
 - 22. The process of Claim 21, wherein desposition of the etch stop layer is carried out at about the same temperature as the reduction of copper oxide.

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- 23. A process for producing an integrated circuit comprising reducing copper oxide on a substrate by exposure to H_2 gas at elevated temperature prior to deposition of an etch stop layer.
- 24. The process of Claim 20, wherein the etch stop layer comprises silicon carbide.
- 25. The process of Claim 24, wherein the etch stop layer further comprises oxygen.
- 26. The process of Claim 23, wherein reduction of copper oxide and deposition of the etch stop layer are carried out in the same reaction chamber.
- 27. The process of Claim 26 wherein deposition of the etch stop layer is carried out at about the same temperature as the reduction of copper oxide.
- 28. A process for producing an integrated circuit comprising the following steps, in order:

depositing a copper layer on a substrate; subjecting the copper layer to a CMP process; contacting the substrate with one or more organic reducing agents; and depositing an etch stop layer on the substrate.

- 29. The process of Claim 28, wherein the organic reducing agent comprises at least one functional group selected from the group consisting of alcohol (-OH), aldehyde (-CHO), and carboxylic acid (-COOH)
- 30. The process of Claim 28, wherein the etch stop layer comprises silicon carbide.
- 31. The process of Claim 30, wherein the etch stop layer further comprises oxygen.
- 25 32. The process of Claim 28, wherein the etch stop layer comprises silicon nitride.